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**United States Patent** [19]

Biggs et al.

[11] **Patent Number:** 5,308,936[45] **Date of Patent:** May 3, 1994[54] **ULTRASONIC PEN-TYPE DATA INPUT DEVICE**

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[52] U.S. Cl. .... **178/18; 178/19; 382/3**

[58] Field of Search ..... 178/18, 19; 340/706, 340/712; 382/3

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[57] **ABSTRACT**

A computer data input device is provided which is characterized by a wireless pen for moving over the surface of a tablet. The pen will simultaneously emit magnetic pulses and ultrasonic pulses. The tablet will be equipped with a magnetic detection coil and two microphones. The magnetic detection coil will nearly instantaneously detect the magnetic pulse and serve as a time reference for determining the time it takes to detect the ultrasonic pulses. The detection circuitry will detect a specific point within the ultrasonic pulse and the time travel of the sonic pulse to the two microphones will be used to determine the distance of the pen from the two microphones yielding the position of the pen over the surface of the tablet.

**51 Claims, 10 Drawing Sheets**

